Use of the Propodium as a Swimming Organ in an Ancillid

(Gastropoda : Olividae)

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(Plate 53; 1 Text figure)

Among the prosobranch molluscs swimming as the prime method of locomotion is confined to the pelagic Heteropoda although there are reports that several members of the families Olividae and Naticidae are capable of brief "flights" of swimming activity.

d'Orbigny (1841, p. 418) observed this type of locomotion in *Oliva tehuelchana* (d'Orbigny, 1841), and Olsson (1956, p. 161) mentioned the swimming ability of species of the genus *Olivella*. Marcus & Marcus (1959, p. 103) reported swimming in *Olivella verreauxii* (Ducros, 1857). In all these cases the movement was effected by the lateral wing-like flaps of the metapodium which characteristically fold over and cover the shell in members of the Olividae. There are no details in these reports concerning the duration of the swimming activity or the circumstances in which it occurred.

Ziegelmeier (1958) reported swimming in the Mediterranean naticid *Polinices josephinus* (Risso, 1838). In this case the propodium is the propulsive organ. The animal "swims" in two positions. Most frequently it remains in the normal crawling position and the "whipping" of the propodium lifts the front end of the body off the sand and propels it forward. The posterior part of the foot remains in contact with the surface of the sand. Less commonly the animal twists into an upside-down position and the "whipping" of the propodium lifts the animal off the substrate and propels it forward a distance of 3 to 5 cm (in a large animal) for each stroke. Each propodium stroke is from the horizontal position upwards, almost as far as the anterior wall of the shell, and then downwards again to the original position, and lasts between 1 and 2 seconds. Ziegelmeier interpreted both forms of "swimming" behaviour as escape or "flight" reactions. It occurred when crawling animals were touched with a stick or when they collided with another animal.

Similar behaviour by the ancillid *Ancillista cingulata* (Sowerby, 1830) was observed on a recent field trip in the North-West of Western Australia. A single specimen was collected in fairly coarse sand on an intertidal sand flat on the western side of Point Cloates (22° 43′ S; 113° 40′ E). It was crawling beneath the surface of the sand and left a long trail, wider than those of *Oliva ornata* Marrat, 1870, which is common at the same place. The preserved body and the shell of the specimen are now in the collection of the Western Australian Museum (cat. no. 4902-68).

External Anatomy of *Ancillista cingulata*

Like other olivids, the foot of this specimen of *Ancillista cingulata* is divided by curved transverse grooves on both dorsal and ventral surfaces into a crescent-shaped anterior part, or propodium, and a posterior part, or metapodium. (For detailed structure of *Oliva*, *Olivella* and *Olivancillaria* see Marcus & Marcus, 1959). The anterior edge of the propodium does not have a deep horizontal groove as in *Oliva* and *Olivella* but there is a deep medial longitudinal groove from the anterior margin to the posterior margin on the dorsal surface. At its posterior end the metapodium is deeply forked, a characteristic of the subfamily Ancillarinae (see Olsson, 1956, p. 169). The much reduced head is completely covered by the anterior ends of the lateral metapodial flaps, and is represented by only 2 small flap-like tentacles. There are no eyes. Beneath the right hand tentacle the small mouth is located. There is a very thin, elongate operculum carried on the dorsal surface of the metapodium medially, below the spire and concealed by the posterior ends of the lateral metapodial flaps.

In the fully extended crawling position (Plate 53) the foot was greatly expanded (approximately 9 cm long, 6 cm broad) and the length of the propodium was a little less than one quarter of the total foot length, i. e. rather larger than in other olivids. The lateral flaps of the metapodium covered the body whorl of the shell, except when the animal was disturbed, but they gaped around the spire so that that part of the shell was usually

A living specimen of *Ancillista cingulata* (SOWERBY, 1830),
collected at Point Cloates, Western Australia,
in the fully extended crawling position.